

M-RAD Team Meeting Agenda

Date: Thursday January 19, 2017

Start Time: 3:30 pm

Location: Senior Design Suite

Attendance: Blake, Kyle, Fawaz, Selso

Late/Absent:

Meeting Objective:

- Present Blake's work during the break
 - *Designed and Machined - Piston Foot, Spindle Pulley, Spindle Nut, Backlash Calibration Tool, and Stepper Pulley*
 - *Designed - Stepper Motor Bracket and Top of Arbor*
- Torque Sensor Results
 - *Overall Concept Works voltage difference between piezoelectric sensors is read when a torque is applied*
 - *Problems – Noise in signal, Hysteresis, Slop in the Cylinder, and Spacer Plates on Sensors are too large to contact surface*
- Machining Plans for the Semester
 - *Machine all parts as soon as they are fully designed*
 - *Get a quote from Machining Company in Lewiston for Water Jet work on our platform*
- Design Plans Remaining
 - *Design a retraction Spring for Solenoid*
 - *Design the Control System for the machine*
- Calendar for Rest of Semester
 - *Snapshot Day, Expo Day, Detailed Design Review, Goals for project advancement*
- Bill of Materials
 - *Updated BOM on Shared Drive*
- Purchased Part Models
 - *Parts that need to be ordered*

Other Information & Business:

Tasks:

Blake: *Machine-Stepper Motor Bracket, Base when fully designed, Spindle Pulley*

Kyle: *Order Parts, Research Water Jet*

Selso: *Validate Torque Sensor, Plan for Coding a Stepper Motor, Design Return Spring, Machine Bumper Plate*

Fawaz: *Design Block for Testing Torque Sensor with Turrets*

Next Meeting:

Date: Monday January 23, 2017

Start Time: 12:30 pm

Location: Lounge by Dr. Odom's Office

Meeting Ended: 4:32 pm

M-RAD Team Meeting Agenda

Date: Monday January 23, 2017

Start Time: 12:30 pm

Location: Lounge by Dr. Odom's Office

Attendance: Blake, Kyle, Selso, Dr. Dan

Meeting Objective:

- Machining that has been complete
 - Manufacture Bumper Plate and Pulley Spindle on Wednesday
- Torque Sensor Progress
 - Calibrate using Simulink by Next meeting
- Parts that have been ordered
 - Motor shield Stepper driver
- Quote on Water Jet
 - Gateway in Lewiston , January 23
 - Platform Changes: Hole Pattern, Chamfer, Engraving
- Design Presentations, Retraction Spring, Torque Testing Fixture
 - Design Review presentation when we have a functioning prototype
 - Model Retraction Spring
 - Design Torque Testing Fixture
- Create a detailed Calendar for the rest of the semester
 - Add Platform to BOM
 - Add components to BOM as we design and Build them

Tasks:

Blake: Machine Spindle Pulley

Kyle: Water Jet, Gateway Platform

Selso: CNC Bumper Plate

Fawaz: Design & Build Torque testing Fixture

Next Meeting:

Date: Thursday January 26, 2017

Start Time: 3:30 pm

Location: Senior Design Suite

Meeting Ended: 1:15 pm

M-RAD Team Meeting Agenda

Date: Tuesday January 31, 2017

Start Time: 3:30 pm

Location: Senior Design Suite

Attendance: Blake, Selso, Kyle, Fawaz, Dr. Dan

Meeting Objective:

- Plans For Machining
 - *Arbor*
 - *Cut pipe and thread it*
- Torque Sensor Findings
 - *Amplify sensor signals*
 - *Reduce Noise*
 - *Remove Hysteresis*
- Potentiometer Calibration and Findings
 - *Potentiometer Measures accurately*
 - *Resolution in 8-Bit DAC is too Low to read resolution we need*
 - *Talk to Dr. Wolbrech*
 - *Provide a buffer to protect voltage*
 - *Use two power supplies*
- Parts that have been ordered
 - *Platform from Gateway*
- Design Review
 - *Build everything and put it together*
- Fix a meeting Time
 - *3:30 pm Tuesdays in the Senior Design Suite*

Other Information & Business:

- *Stepper Motor Coding*
- *Build Retraction Spring for Solenoid*

Tasks:

Blake: *Thread Pipe*

Kyle: *Thread Pipe*

Selso: *Chamfer Clamping Blocks*

Fawaz: *Find Bulk head air fittings and 90 degree air fittings*

Next Meeting:

Date: 2/2/2017

Start Time: 3:30 Pm

Location: Senior Design Suite

Meeting Ended: 4:30 pm

M-RAD Team Meeting Agenda

Date: Tuesday February 07, 2017

Start Time: 3:32 pm

Location: Senior Design Suite

Attendance: Fawaz, Kyle, Blake, Selso, Dr. Dan

Meeting Objective:

- Machining of Top of Arbor, Wednesday Feb 15, 2017
 - *Machine new arbor to hold slot cutter for Machining of top of arbor*
- Linear Encoder
 - *Higher Resolution*
 - *Higher cost*
 - *Potentiometer readings can be obscured with high voltage power draws of other sources*
 - *2 power sources needed*
 - *Find the appropriate A to D converter to read a resolution of .0001*
 - *Riftek Linear Encoder \$700*
 - *Ask Ankit for help with potentiometer*
- Stepper Motor Driver
 - *Use an H-Bridge to drive motor*
- Platform Progress
 - *In progress at Gateway, Fix flange hole pattern*
- Solenoid Retraction
 - *Machine spacers*

Other Information & Business:

- *Find the correct orifice and air regulator*
- *Have a preliminary prototype for design review*
- *Design detent on spindle*
- *Mechanically amplify Backlash*

Tasks:

Blake: *Thread Pipe and Machine Arbor for Slot Cutter*

Kyle: *Talk to Dr. Wolbrech*

Selso: *Talk to Ankit*

Fawaz: *Wikipage Update, Model Chuck on Solidworks assembly*

Next Meeting:

Date: Tuesday February 14, 2017

Start Time: After Class

Location: N/A

Meeting Ended: 3:57 pm

M-RAD Team Meeting Agenda

Date: Tuesday February 14, 2017

Start Time: 4:15 pm

Location: EP Building

Attendance: Blake, Kyle, Selso, Fawaz

Meeting Objective:

- Machining of Top of Arbor, Wednesday Feb 15, 2017@ 9:30 am, Mastercam Complete
 - *Mastercam program is complete*
- Linear Encoder Research
 - *Find ways to not use it and use the potentiometer*
- Potentiometer Further Results
 - *Extended Arduino A to D Converter*
 - *Reads 16 bits*
 - *Use separate power supply for this*
- Stepper Motor Driver Coding
 - *Create a scudo code*
- Platform Complete
 - *Kyle will figure out how we need to pay for it*
 - *Selso could possibly pick it up on Friday*
- Solenoid Retraction Progress
 - *Plate is machined*
 - *Positioner needs to be machined*

Other Information & Business:

- *Order Arduino Mega*
- *Order Arduino Motor Shield*
- *Update BOM*
- *Update Wikipage*
- *Build prototype on Tuesday*
- *Decide on Power supplies*
- *Trouble shoot H-Bridge and Stepper Motor*

Tasks:

Blake: **Research DAC devices**

Kyle: **Order Arduino Parts and pay for platform**

Selso: **Machine Top of Arbor**

Fawaz: **Update Wikipage**

Next Meeting:

Date: Thursday February 16 2017

Start Time: 3:30 pm

Location: Senior Design Suite

Meeting Ended: 4:45 pm

M-RAD Team Meeting Agenda

Date: Tuesday February 21, 2017

Start Time: 3:30 PM

Location: Senior Design Suite

Attendance: Blake, Fawaz, Selso, Dr. Dan

Late/Absent: Kyle

Meeting Objective:

- Top of Arbor Machining Results Further Machining
 - *Evaluate finish, What More should we do to finish it*
- Assemble Hardware
 - *All components are ready to be assembled*
- Potentiometer with Arduino Data Acquisition
 - *Use extended ADC attachment to validate potentiometer*
- Stepper Motor Driver Coding using Arduino Motor Shield
 - *Use motor shield to stepper Use Arduino Mega*
- Machine Remaining Components
 - *Spring Retraction Positioner*
- Goals before Spring Break
 - *Manual drive using Stepper*
 - *Snapshot Day*
 - *Potentiometer Results*
 - *Fully Machined Prototype*

Tasks:

Blake: *Chamfer edges of platform and Tap holes*

Kyle: *Work on Portfolio*

Selso: *Drive Stepper motor*

Fawaz: *Bead Blast and Paint Platform*

Next Meeting:

Date: Thursday March 2, 2017

Start Time: 3:30 pm

Location: Senior Design Suite

Meeting Ended: 4:07 pm

M-RAD Team Meeting Agenda

Date: March 2, 2017

Start Time: 3:30 PM

Location: Senior Design Suite

Attendance: Blake, Kyle, Fawaz, Selso

Late/Absent:

Meeting Objective:

- Snapshot, Wikipage, Team Portfolio, Team Member Citizenship From Tuesday March 7, 2017
 - *Fix Prototype and Create Poster*
- Spindle Alignment and Length
 - *Measure how much the alignment is off*
 - *Move Flange*
 - *Cut spindle length and add detent*
- Complete Machining on Top of Arbor
 - *Cut out the Corners of the Top of Arbor*
- Test ADC adaptor using power supply and Arduino Mega
 - *Figure out how to configure with Arduino*
- Test Torque Sensor on Completed Assembly using Arduino Mega
 - *Test after Shaft is aligned*
- Code Stepper Motor and Develop Working Diagram Using Motor Driver, Power Supply, and Arduino
 - *Code for forward and Backward Drive*
- Shoot for a Detailed design review Date
 - *1st or 2nd Week after break*
- Registration For Expo is Complete

Tasks:

Blake: *Cut Shaft to Length*

Kyle: *Make Poster and Update Team Portfolio*

Selso: *Make stepper motor work appropriately*

Fawaz: *Update Wikipage*

Next Meeting:

Date: Monday March 6, 2017

Start Time: 3:30 pm

Location: Senior Design Suite

Meeting Ended: 4:34 pm

M-RAD Team Meeting Agenda

Date: March 21, 2017

Start Time: 4:11 pm

Location: Engineering Physics Building

Attendance: Kyle, Blake, Selso, Dr. Dan

Meeting Objective:

- Spindle Alignment
 - Spring broke on end of Shaft a stronger one is needed
 - Look into flexible shafts
 - Alignment of the shaft may be necessary
- ADC Shield
 - Works as desired reading the resolution we need
 - Check again with potentiometer
 - Some noise is picked up in the signal
- Design of Spindle Detent
 - Use a pin and spring in spindle pulley
 - Cut a groove in the shaft to allow pin slip in and out of easily
- Torque sensor findings while on assembly
 - Torque is not being read on turret
 - Try using the Analog to digital converter
 - Redesign sensor to have bearings to reduce slop
- Retraction Spring Location
 - Find a good spot to position the springs to reduce binding in solenoid and potentiometer
- Detailed design review date
 - Thursday April 6, @ Night Force, Agree on a time

Tasks:

Blake: Redesign Torque Sensor

Kyle: Design Spindle Detent

Selso: Develop a Stepper Code Program

Fawaz: Work on Wikipage

Next Meeting:

Date: 03/28/2017

Start Time: 3:30 pm

Location: Senior Design Suite

Meeting Ended: 4:35 pm

M-RAD Team Meeting Agenda

Date: March 28, 2017

Start Time: 3:30 pm

Location: Senior Design Suite

Attendance: Kyle, Blake, Selso, Fawaz, Dr. Dan

Late/Absent:

Meeting Objective:

- Spindle Detent Design
 - Spring and push rod on the bottom to the spindle pulley system
 - Held in place with a set screw
 - Groove cut onto the shaft
- New Torque Sensor Design
 - Bearings fixed on the top and bottom of the sensor to prevent binding
 - Slot on top to ensure correct position
- Detailed design review date Details and Goals
 - Be able to burnish a turret manually or with torque sensor data
 - Have torque sensor display data
 - Show that the backlash sensor will work
- Stepper Motor Findings
 - Stepper motor is too slow
 - Get a stepper motor with a higher speed

Tasks:

Blake: Machine new Torque Sensors

Kyle: Order parts for spring spindle detent

Selso: Work on Stepper code and design new stepper bracket

Fawaz: Update information Help design and Machine new stepper bracket

Next Meeting:

Date: 04/04/2017

Start Time: 3:30 pm

Location: Senior Design Suite

Meeting Ended: 4:17 pm

M-RAD Team Meeting Agenda

Date: April 4, 2017

Start Time: 3:31 pm

Location: Senior Design Suite

Attendance: Kyle, Blake, Selso, Fawaz, Dr. Dan

Late/Absent:

Meeting Objective:

- Detailed design review date, Details and Goals
 - Have Arduino program run through the code and burnish a turret
 - Use torque data for burnishing
- Stepper Motor Findings
 - Stepper driver is not capable of outputting the correct voltage and current
 - Motor stalls on bound up turrets
- Automated Burnishing Code
 - Code is running using False torque data and executes the tasks correctly
 - Incorporate lights to indicate where in the process the program is
- Design Review Presentation
 - Changes we have made since the first presentation
 - Breakdown components
 - Pseudo code, Budget
 - Bill of Materials
 - Torque Sensor Findings

Tasks:

Blake: Work on Arduino Code

Kyle: Update Presentation

Selso: Work on Arduino Code

Fawaz: Update Presentation

Next Meeting:

Date: 07/11/2017

Start Time: 3:30 pm

Location: Senior Design Suite

Meeting Ended: 4:33 pm

M-RAD Team Meeting Agenda

Date: April 11, 2017

Start Time: 3:30 pm

Location: Senior Design Suite

Attendance: *Kyle, Blake, Selso, Fawaz, Dr. Dan*

Late/Absent:

Meeting Objective:

- Design Review feedback
 - Incorporate manual controls
 - Use lights to indicate process
 - Torque value readouts, min and max torque values
 - Forget about the Backlash focus on burnishing
- Torque Sensor Validation
 - Fix hysteresis errors
 - Calibrate to ensure it is reliable
- Spindle Design Adjustments
 - Attach a handle onto the spindle
 - Use a ring magnet to hold the handle in place
 - No extra machining necessary
- Stepper
 - Order a quality driver
 - Use a quality power supply

Tasks:

Blake: *Incorporate Controls*

Kyle: *Order Parts*

Selso: *Design Spindle Adjustments*

Fawaz: *Update Information, help Blake with controls*

Next Meeting:

Date: *04/18/2017*

Start Time: *3:30 pm*

Location: *Senior Design Suite*

Meeting Ended: *4:09 pm*

M-RAD Team Meeting Agenda

Date: April 18, 2017

Start Time: 3:37 pm

Location: Senior Design Suite

Attendance: Kyle, Blake, Selso, Fawaz, Dr. Dan

Late/Absent:

Meeting Objective:

- Stepper Motor Findings
 - New Stepper Driver works well
 - Order a 24 volt power supply
 - Torque on stepper motor is not enough
- Torque Sensor Findings
 - Hysteresis and noise from stepper motor is not acceptable, Sensor is not valid
- Design Expo Perpetration
 - Create a Poster
 - Have machine burnishing turrets using the manual controls
- Manual Controls
 - Clamp toggle switch on and off
 - Dial for # of Revolutions, turret specific
 - Start Direction for left and right threaded turrets
 - On and Off Toggle switch for stepper motor
 - Start button for to initiate the process

Tasks:

Blake: Incorporate switches onto the platform

Kyle: Create Expo Poster

Selso: Help with Expo Poster and Switch incorporation

Fawaz: Update Wikipage and Help with Expo Poster

Next Meeting:

Date: 04/25/2017

Start Time: 3:30 pm

Location: Senior Design Suite

Meeting Ended: 4:37 pm

M-RAD Team Meeting Agenda

Date: April 25, 2017

Start Time: 3:30 pm

Location: Senior Design Suite

Attendance: Kyle, Blake, Selso, Fawaz, Dr. Dan

Late/Absent:

Meeting Objective:

- Design Expo
 - Fully Assemble machine and have it burnish turrets
 - Print poster by Today
- Manual Controls
 - Laser Engrave Labels for switch identification
- Power Supply
 - Figure out how to safely use the Stepper motor
 - Connect power supply to the stepper motor
- New Stepper Bracket
 - Design Motor Bracket for NEMA 23 Stepper motor
 - Machine motor bracket

Tasks:

Blake: Machine Motor Bracket

Kyle: Ensure Poster is printed correctly

Selso: Figure out how safely us the power supply

Fawaz: Poster and Bracket Design

Next Meeting:

Date: 05/2/2017

Start Time: 3:30 pm

Location: Senior Design Suite

Meeting Ended: 4:02 pm

M-RAD Team Meeting Agenda

Date: May 02, 2017

Start Time: 3:30 pm

Location: Senior Design Suite

Attendance: Kyle, Blake, Selso, Fawaz, Dr. Dan

Late/Absent:

Meeting Objective:

- Design Report
 - Complete by Friday May 5
 - Assign Each individual a section
- Project Deliverable
 - Show or Project to Night Force on Wednesday
 - Nightforce wants the Project prototype
 - BOM
 - Budget Spent
 - Data Sheets
 - Part numbers
 - Drawing Package
 - Arduino Code

Tasks:

Blake: Show Project to Night Force, Drawings, Arduino Code

Kyle: BOM, Budget, Portfolio

Selso: Data Sheets, Design Report Project Plan, Future Work, Back Ground

Fawaz: Complete Wikipage, Concept Selection

Next Meeting:

Date: 05/04/2017

Start Time: 3:30 pm

Location: Senior Design Suite

Meeting Ended